

Hope for Fire Ant Control

Do insects exist only to make life more difficult for people? Some would say yes, preferring to squash the small critters at every opportunity.

But many insects do, indeed, serve a purpose in the world—pollinating crops, for example. Those insects have an indirect though important role in feeding the world.

Then there are beneficial insect predators and parasites, such as flies and wasps that attack other insects, thus helping to maintain an ecological balance. These beneficials form the basis of our biological control research, keeping pest insects like boll weevils, corn borers, and fruit flies from destroying millions of dollars in crops.

But what happens when an insect is both a helpful predator and a pest? What happens when this insect tips the ecological scales? Many states are finding out.

Red imported fire ants heavily infest more than 300 million acres in 12 southern states and Puerto Rico: Texas, Oklahoma, Arkansas, Louisiana, Alabama, Mississippi, Florida, Georgia, North and South Carolina, Tennessee, and Virginia. Recently they've become established in limited areas in California and New Mexico.

Fire ants are thought to have come into the United States on contaminated ships arriving in Mobile, Alabama, from South America in the early 1930s. They've spread slowly but steadily. Depending on soil types and seasons, their colonies may be entirely underground or in mounds ranging from 6 to 18 inches high. This causes trouble in areas such as playgrounds, parks, beaches, and wildlife refuges. The ants' aggressiveness and ability to reproduce and outcompete others for food have allowed them to displace many beneficial insects and other animals that make up our important biodiversity.

These tiny pests, generally known for their burning sting, have caused billions of dollars in damage and control costs since entering the United States. Scientists believe red imported fire ants have flourished here because they have no natural enemies. The ecological balance has shifted in their favor. U.S. red imported fire ant densities are about five times those in their native South American habitat.

Researchers with the Agricultural Research Service's Center for Medical, Agricultural, and Veterinary Entomology in Gainesville, Florida, are trying to even the ecological playing field by working with state government and extension representatives to release natural fire ant enemies from South America.

In 1998, ARS scientists, along with representatives from the Council of State Governments' Southern Legislative Conference, initiated a National Fire Ant Strategy to help tackle the fire ant problem. In each of the infested states, an appointed state government representative and a team of state researchers work with ARS scientists and state extension personnel in cooperative field research.

The goal is to reduce imported fire ant infestations to levels below economic thresholds on agricultural lands. One way to help achieve this is by using biological controls to help tip the scale in favor of native ant species. In the past 2 years, ARS scientists have been working with state personnel on releasing biological control agents in 10 states.

ARS kicked off the first of these releases in July 1997. Tiny Brazilian phorid flies, *Pseudacteon tricuspis*, were released at sites in Gainesville, Florida. Phorid flies are deadly enemies of fire ants, stinging them and depositing eggs inside their bodies. Each fly larva eventually grows and moves into the host ant's head. When the larva is mature, it decapitates the ant and completes its development inside the severed head. Scientists believe these parasitic flies help

reduce fire ant populations in South America—and could do the same in the United States.

The second biological control agent release took place in Hope, Arkansas, in May 1998. ARS scientists, in cooperation with Arkansas officials, released fire ant larvae infected with *Thelohania solenopsae*, a microorganism from South America that infects fire ant colonies and chronically weakens them. Unsuspecting worker ants transfer the pathogen to the queen through food exchange. The disease slowly reduces her weight and the number of eggs she lays. The pathogen ultimately infects all workers, eventually weakening the colony and causing its demise.

ARS scientists provide the biological control agents and train state personnel on their release. ARS scientists also provide specialized expertise, data management, and interpretation of data from field releases of biological controls. Cooperating states have provided some funding to supplement federal resources and personnel to rear and release biological control agents and to assist in monitoring their impact.

Although ARS has also developed other strategies for controlling fire ants, including commercially available baits, our current emphasis is on biologically based technologies.

This latest endeavor with fire ants has opened the doors for large-scale cooperation among many states. The combined efforts could soon make it possible for native ants to have a chance to thrive and compete again.

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